EPA DRAFT PERMIT MODIFICATION FOR THE PHILIP-GEORGETOWN RCRA FACILITY JANUARY 15, 2001

(1/15/01)

PHILIP-GEORGETOWN FACILITY
WAD 00081 2909
MODIFIED
CORRECTIVE ACTION
SCHEDULE & PERMIT CONDITIONS

(to replace permit section VII)

VII.A. Corrective Action Requirements

VII.A.1. In the event any permit condition in Part VII of this permit is in conflict with any provisions in the approved workplans and reports submitted pursuant to Part VII of this permit, the permit condition shall be the applicable requirement.

VII.A.2. In this section of the permit the following terms have the respective meanings:

• *Corrective Action* refers to the process, and actions within that process, to investigate and cleanup environmental contamination from facility releases of 40 CFR 261, Appendix 8, RCRA hazardous constituents;

• *Corrective Measure* refers to the RCRA cleanup action for the facility/site;

• *Environmental Indicators* are results-based measures of corrective action progress that are the Environmental Protection Agency's primary interim cleanup goals. There are two such indicators for RCRA Corrective Action:

a) "Current Human Exposures Under Control." When this Indicator has been met it is based on an EPA conclusion that there are no "unacceptable" human exposures to "contamination" that can reasonably be expected under current soil and groundwater use conditions. And,

b) "Migration of contaminated Groundwater Under Control." When this Indicator has been met it is based on an EPA conclusion that migration of "contaminated" groundwater has stabilized, that the contaminants in the groundwater do not discharge into surface water at currently "unacceptable" levels, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater."

• *Practical Quantitation Levels*, or PQLs, refer to analytical levels which are the lowest concentrations of analytes in groundwater that can be reliably determined within specified limits of precision and accuracy by the indicated methods under routine laboratory conditions.

• *Remedy*, or *remedial action*, is used interchangeably with Corrective Measure; and,

• *Remedial alternative* is used interchangeably with *Corrective Measure alternative*. Both mean a cleanup option.

VII.A.3. RCRA Facility Investigation (RFI):

a) The Permittee shall complete a RCRA Facility Investigation (RFI) to fully delineate the nature and extent of hazardous constituents released at or from the facility. The Permittee shall perform all tasks and activities specified in the Permittee's Final RFI Addendum Scope of Work (submitted in 10/99), the Administrator-approved Supplemental Off-site Characterization Work Plan (approved on 9/29/00), the Risk Assessment Work Plan (see A.3.d. below), and the Administrator-approved Soil Gas Sampling and Analysis Plan (approved on 12/4/00). The Supplemental Off-site Characterization Work Plan, the Final RFI Addendum Scope of Work, and the Soil Gas Sampling and Analysis Plan are hereby incorporated by reference as Attachment NN of this permit. As part of this RFI effort, the Permittee shall notify all property owners whose property lies above groundwater containing hazardous constituents exceeding screening levels (A.4.a.7.) based on residential ingestion of the groundwater as drinking water.

b) All RFI work conducted pursuant to this permit condition shall be completed by schedules contained in Attachment NN.

c) As a result of investigation findings, additional work may be required to complete the RFI. In such cases the Permittee shall meet the requirements of VII.A.5. for amending the RFI.

d) Human Health and Ecological Risk Assessment Work Plan.

A quantitative human health and ecological risk assessment will be conducted for the site to assess current and future exposure pathways and to define risk-based remediation goals and proposed points of compliance. The risk assessment work plan shall provide the methodologies and specific data usability requirements for the RFI risk assessment, and assessment uncertainty/error analysis. The schedule for submitting this Work Plan to the Administrator is contained in Table VII-1.

Draft Human Health and Ecological Risk Assessment Work Plan: A work plan was submitted to the Administrator on November 14, 2000. Subsequently (January 9, 2001), the Administrator provided the Permittee comments on this document. By the date established for its submission in Table VII-1, a Draft Human Health and Ecological Risk Assessment Work Plan shall be submitted to the Administrator.

Final Human Health and Ecological Risk Assessment Work Plan: The Administrator shall review the draft Risk Assessment Work plan and approve it as Final, approve it as Final with modifications, or disapprove it with comments. In the latter case, the Permittee shall submit a revised version of the Work Plan, per

Table VII-1, that satisfactorily addresses the Administrator's comments. Failure to submit a revised Work Plan which adequately addresses each of the Administrator's comments shall constitute a violation of this permit. In such cases the Administrator will approve the revision as Final with modifications, or disapprove it with comments.

VII.A.4. RCRA Facility Investigation (RFI) Report:

The Permittee shall document the results of the investigation, based on data collected during the RFI, and submit a draft Comprehensive RFI Report (as required by VII.A.4.) to the Administrator by a date identified in Table VII-1.

a) Draft Comprehensive RFI Report: This report shall include:

(1) conclusions and findings, substantively supported, of the investigations performed to characterize media actually or potentially contaminated by releases from the facility. Findings and conclusions will include descriptions of below-surface stratigraphy and hydrogeologic parameters, as well as characterization of the nature and extent of hazardous constituents.

(2) results of a groundwater beneficial use analysis (as specified in the Final RFI Scope of Work, Attachment NN).

(3) results from groundwater and soil gas modeling projects (including those specified in Attachment NN), including assumptions made, calculations used, and tables and figures.

(4) summary tables of all soil, soil gas, groundwater, and air monitoring/sampling results to include: sample collection date; sample location; constituents analyzed for and their concentrations; method reporting limits (as well as achieved Method Detection Limits and Practical Quantitation Levels) ; and the media-specific preliminary remediation goals, as described in the final, approved Risk Assessment Work Plan (VII.A.3.d.).

(5) maps identifying the locations of all investigation-related sampling, and all remediation-related monitoring locations.

(6) an assessment of pathway-specific, as well as cumulative, risks to human and ecological receptors. This risk assessment shall be undertaken in a manner consistent with EPA RCRA guidances and the Washington State Department of Ecology regulations and guidances, as specified in the

final, approved Risk Assessment Work Plan.

(7) a description and discussion of the groundwater "point of compliance". This point of compliance is herein defined as the location(s) where the Permittee shall meet groundwater remedial levels. The point of compliance is established as those wells where the lowest of the following screening criteria are, or have been since January 1, 1998, exceeded: Washington State Department of Ecology Model Toxics Control Act (MTCA) Method B groundwater cleanup criteria; MTCA Method A groundwater cleanup criteria; the EPA SDWA Maximum Contaminant Levels (MCLs), any non-zero MCL goals, and conservative, peer-reviewed (by the scientific community), ecological risk-based concentrations for Duwamish River receptors approved by the Administrator in the Risk Assessment Work Plan.

8) may include a clearly defined, proposed modification to the point of compliance in (7) above for the remedial action objectives that will be used in the site-specific Corrective Measures Study, or "CMS". Such a modification may be requested for cases where the Permittee believes the point of compliance should not include contaminated groundwater within the facility's property limits, and/or where the results of the risk assessment (performed according to requirements in (6) above) indicate that new criteria should be used to define those wells where remedial action levels must be met. Inclusion of a newly proposed point of compliance in the RFI Report shall not require a permit modification.

(9) proposed preliminary remedial action levels and preliminary remedial action objectives to be used in the CMS, following approval by the Administrator. These preliminary levels shall include, but not be limited to, the "standard" levels for those constituents listed in Table VII-4 (Groundwater Cleanup Levels), unless: a) groundwater exposure point concentrations are demonstrably below the "standard" levels, or b) EPA-approved adjustments to the "standard" levels have been issued. In this latter case, the Permittee may propose these new adjustments in the draft RFI Report for the Administrator's review.

As part of this identification of preliminary cleanup levels and objectives, the Permittee shall attach to the Report a determination as to whether the Environmental Indicators for protecting current human receptors from unacceptable exposures, and for stopping the downgradient movement of contaminated groundwater, have been met. If one or both of the two Indicators have not been met, the Permittee shall submit an Interim Measures Work Plan, due on the date established in Table VII-1 for the

Final Comprehensive RFI Report, to meet the requirements of VII.C. The Administrator shall review the Environmental Indicator determinations together with the rest of the draft RFI Report, and approve, disapprove, or approve them with comments in the Administrator's response to the draft Report.

(10) results of quality assurance activities and how and why they relate to the RFI Report's findings and conclusions, as specified in the final RFI Scope of Work (Attachment NN) and final, approved Risk Assessment Work Plan. This assessment of data quality shall be consistent with EPA's July 1996 Guidance for Data Quality Assessment (QA/G-9), and any updates provided in EPA's Quality Assurance Website.

(11) a discussion of the analysis of data usability and the results of that analysis. As required by the RFI SOW and Risk Assessment Work Plan, the Permittee shall calculate and evaluate the potential error associated with findings.

(12) a proposal for a new schedule for corrective action progress reports (condition VII.A.6.) to begin once the Administrator approves the Final Comprehensive RFI Report (VII.A.3.b.). These progress reports shall not be submitted less frequently than quarterly.

(13) a draft Community Relations Plan containing, at a minimum:

i) public notice requirements (from 40 CFR 270.42 and 40 CFR 124) and planned activities, and how the Permittee shall meet these requirements and activities;

ii) the location of the Permittee's repository;

iii) methods for identifying the public's concerns;

iv) methods for addressing the public's concerns and conveying information to the public; and,

v) procedures for modifying the Plan (per 40 CFR 270.42).

The draft Plan shall be consistent with EPA's 1996 RCRA Public Participation Manual and the December 11, 1995, final RCRA Expanded Public Participation Rule (60 FR 63417).

(14) a CMS Scope of Work Technical Memorandum, proposing the focus

and format of the CMS.

(15) the location of the Permittee's data/record storage, and the measures to be used to maintain and secure it (per VII.A.8.).

(16) an estimate of costs to complete all future corrective actions, as required by VII.J.

(17) a brief account of efforts made, in finalizing the RFI, to notify all property owners whose property lies above groundwater containing hazardous constituents exceeding screening levels based on residential ingestion.

b) Final Comprehensive RFI Report: The Administrator shall review the draft RFI Report and approve it as Final, approve it as Final with modifications, or disapprove it with comments. In the latter case, the Permittee shall submit to the Administrator for review and approval a revised draft of the RFI Report, per Table VII-1, that satisfactorily addresses the Administrator's comments. Failure to submit a revised Report which adequately addresses each of the Administrator's comments shall constitute a violation of this permit. In such cases the Administrator will approve the revision as Final with modifications, or disapprove it with comments.

VII.A.5. Amendments to the RFI: Additional RFI work may become necessary due to the discovery of new information. The Permittee shall submit a Work Plan for performance of the additional work to the Administrator for approval within sixty (60) days of the Permittee's knowledge of such a need. "Knowledge of a need" in this context will be either the Permittee's identification of such a need or notification from the Administrator that such a need exists.

The Administrator shall review the Work Plan and approve it as Final, approve it as Final with modifications, or disapprove it with comments. In the latter case, the Permittee shall, by a date established in the Administrator's comment letter, submit a revised Work Plan for the Administrator's review and approval that satisfactorily addresses the Administrator's comments. Failure to submit a revised Work Plan which adequately addresses each of the Administrator's comments shall constitute a violation of this permit. In such cases the Administrator will approve the revision as Final with modifications, or disapprove it with comments.

VII.A.6. Upon final approval of any RFI Work Plan submitted pursuant to VII.A.5., the Permittee shall complete the tasks outlined in the Work Plan in accordance with its respective terms and schedules.

VII.A.7. RFI Progress Reports: Progress Reports on the RFI shall be submitted to the Administrator within 6 months of the effective date of the permit and every six months thereafter through approval of the Final Comprehensive RFI Report, in accordance with VII.A.3.b. Each progress report shall contain the following information:

a) a description of the work completed;

b) summaries of all findings;

c) summaries of all problems encountered during the reporting period;

d) actions taken to rectify problems; and,

e) projected work for the next reporting period.

If, in the future, the Administrator determines, based on the amount and frequency of information being communicated by the Permittee, that six month intervals are too long, the Administrator shall notify the Permittee that quarterly reports must be submitted. The Permittee shall then have no more than ninety (90) days to submit the first quarterly progress report. Reports shall continue to be submitted by the Permittee every three months from that first quarterly progress report submittal date.

VII.A.8. All Corrective Action documents, reports, plans, and data collected to support an Interim Measure (VII.C.) and/or Corrective Measure (VII.D.), shall be stored and maintained at a secure location approved by the Administrator (as set out in VII.A.4.a.15.) . Such archiving must be maintained for a period not less than ten years after termination of Compliance Monitoring.

VII.A.9. An operating record shall be kept to document corrective action activities. This record may be included within the operating record required by Condition II.C.2. of the facility's "operating permit."

VII.A.10. New Solid Waste Management Units. At any time during the life of this corrective action permit, when the Permittee becomes aware of the existence of a previously un-identified solid waste management unit, the Permittee shall notify the Administrator within thirty (30) days of such awareness as to: the nature of the solid waste managed -- and if applicable, being managed -- at the unit; the potential for past, current, and future releases of 40 CFR 260 Appendix 8 hazardous constituents from the unit; dates of operation and/or existence of the unit; any actions that have been taken to control or remediate releases from the unit; any environmental data associated with the unit or media potentially affected by

releases; and, any plans for investigating the unit in accordance with RFI requirements in VII.A.5.

If the Administrator determines, based on the potential for releases from the unit to threaten the health of humans or the environment, that the solid waste management unit must be investigated, the Administrator may direct the Permittee to submit a Work Plan for performance of the additional work. Such a Work Plan must be submitted to the Administrator for review and approval within sixty (60) days. Finalization of this Work Plan shall follow the requirements of VII.A.5.

If the Administrator determines, based on the potential for releases from the unit to threaten the health of humans or the environment, that the solid waste management unit must be expeditiously remediated, the Administrator may direct the Permittee to submit an Interim Measure Work Plan (per the requirements of VII.C.1.). Such a Work Plan must be submitted to the Administrator for review and approval within twenty-one (21) days. Finalization of this Work Plan shall follow the requirements of VII.C.2.

VII.A.11. In accordance with Section 3004(u) of RCRA and the regulations promulgated pursuant thereto, the Permittee must institute Corrective Action as necessary to protect human health and the environment for all releases of hazardous waste(s) or constituents from any solid waste management units (SWMUs) at the facility, regardless of the time at which waste was placed in such units. Based on the available data regarding the levels and extent of contamination at the facility, EPA has determined the need for corrective measures at the facility.

VII.A.12. In accordance with Section 3004(v) of RCRA and the regulations promulgated pursuant thereto, the Permittee must implement Corrective Action(s) beyond the facility property boundary, where necessary to protect human health and the environment.

VII.B. Pre-Corrective Action Monitoring

The Permittee shall monitor groundwater as required by the approved Pre-Corrective Action Monitoring Plan, hereby incorporated as enforceable permit conditions in Attachment NN, and all subsequent modifications to that Plan approved by the Administrator, until the implementation of the Corrective Measure Groundwater Monitoring program designated in condition VII.E. of this permit.

VII.B.1. The Permittee shall enter all monitoring, testing, and analytical data obtained pursuant to Section VII.B. of this permit in the operating record (as required by VII.A.9.). In addition, all monitoring, testing, and analytical data obtained pursuant to Section VII.B. shall be submitted to the Administrator in digital data files on computer diskette (or other mutually agreeable magnetic media). These data files shall be formatted in accordance with instructions provided by the Administrator.

Quality assured results of analyses, including laboratory detection limits achieved for each constituent, shall be submitted to the Administrator: a) according to the approved Pre-Corrective Action Monitoring Plan, and in any case, b) no later than ninety (90) days following sampling.

VII.B.2. Upon detection of 40 CFR 264 Appendix IX hazardous constituents in any monitoring well exceeding method-specific Practical Quantitation Limits (PQLs), the Permittee shall:

a) Notify the Administrator of this finding in writing within seven (7) calendar days after receiving validated data; and,

b) Within thirty (30) days of the validated Appendix IX detection(s), collect two (2) samples from any affected well(s) and reanalyze both samples for all constituents which were detected above PQLs. Such sampling shall not affect scheduled, Pre-Corrective Action monitoring.

An exception to this requirement is the case where groundwater metals concentrations are detected at levels exceeding PQLs, but at levels the Administrator has determined to be in the range of background concentrations. In this case, the Permittee shall only proceed to VII.B.3. if the validated metal analyte levels exceed screening levels identified in VII.A.4.a.7.

VII.B.3. If analytical results from:

a) Neither verification sample described in permit condition VII.B.2.b. confirm the detection of constituents above the Practical Quantitation Limits (PQLs), the

Permittee shall resume monitoring according to the established schedule and notify the Administrator within seven (7) days of having received the validated verification data;

b) Only one of the verification samples described in permit condition VII.B.2.b. confirms the detection of constituents above the PQLs, the Permittee shall repeat the verification or propose a permit modification to the Administrator, adding the newly detected constituents to the Pre-Corrective Action Monitoring analyte list, and proposing any other changes to the Monitoring Plan deemed necessary based on the analytical results. In either case a notification as to the Permittee's intended course of action shall be submitted to the Administrator within seven (7) of receipt of the verification data;

c) Both verification samples described in permit condition VII.B.2.b. confirm the detection of constituents above the PQLs, or if one or more of the *second set* of verification samples taken (per VII.B.3.b.) confirms such detection, the Permittee shall continue to monitor in accordance with the approved monitoring program in effect, but shall, within twenty-one (21) day, propose a permit modification to the Administrator, adding the newly detected constituents to the Pre-Corrective Action Monitoring analyte list, and proposing any other changes to the Monitoring Plan deemed necessary based on the analytical results.

VII.B.4. If the Permittee or the Administrator concludes that the Pre-Corrective Action Monitoring Plan must be revised, the Permittee shall propose such revisions in a permit modification request (per 40 CFR 270.42) or the Administer may initiate such a modification (per 40 CFR 270.41).

VII.C. Interim Measures

Throughout the term of this permit, the Permittee shall continuously consider and evaluate information regarding releases, suspected releases, and/or potential releases of hazardous constituents and wastes from the facility. If the Permittee identifies a potential imminent and/or substantial threat to human health or the environment, the Permittee shall immediately notify the Administrator by telephone. The Permittee shall additionally notify the Administrator in writing within seven (7) calendar days of such identification, describing the threat and any actions taken or proposed to be taken.

If the Administrator determines that any release, suspected release, or potential release of hazardous constituents at or from the facility may present a potential imminent and/or substantial threat, or a need or opportunity to begin expedited cleanup actions, the Administrator shall, in writing, direct the Permittee to design and implement an interim measure. Any interim measure shall be designed to protect human health and the environment and, to the maximum extent practicable, shall also strive to be consistent with, and capable of being integrated into, likely final corrective measures for the facility.

If the Administrator determines that any release, suspected release, or potential release of hazardous constituents at or from the facility results in groundwater contamination continuing to migrate downgradient at unacceptable levels (defined as RFI screening levels prior to the start of Corrective Measure Monitoring, and refined to remedial or clean up levels following Corrective Measure selection), the Administrator may, in writing, direct the Permittee to plan, design, and implement an interim measure. In particular, if the draft RFI Report determines that one or both of the two Environmental Indicators have not been met, or the Administrator makes this determination following review of the draft RFI Report, the Permittee may be directed to plan, design, and implement an interim measure. In such cases the Permittee shall submit an Interim Measures Workplan, and design and implement interim measures per a schedule which will, by 2005, result in the control of the movement of groundwater contaminants at unacceptable levels. To the maximum extent practicable, such interim measures will be designed to be consistent with a likely final corrective measure for the facility.

VII.C.1. Draft Interim Measures Work Plan

Within twenty-one (21) calendar days of the Permittee's seven-day notification, or by such earlier or later date as may be required by written notification from the Administrator, the Permittee shall prepare and submit a draft Interim Measure Work Plan describing the nature of the threat, need, and/or opportunity, and proposing measures to address such threat, need, or opportunity. The Work Plan

shall specifically include:

a) the proposed scheduling of a feasibility study, if required by the Administrator in order to select an optimal interim remedy;

b) a proposal and justification for the measure's design, operating procedures, and decontamination methods, to address the area(s) of contamination;

c) a summary of all relevant monitoring data, as well as information supporting the proposed location(s) for interim measures;

d) a project-specific data collection and management plan for obtaining and reporting quality assured results;

e) proposed performance goals for the interim measure, definition of "adequate progress" in meeting these goals, and a schedule for periodic evaluations of interim measure effectiveness;

f) any needed proposed changes to the Pre-Corrective Action Monitoring Plan (VII.B.), Corrective Measure Monitoring Plan (VII.E.), or Compliance Monitoring Plan (VII.F.), to measure the effectiveness of the Measure. Or, a separate interim measure monitoring plan; and,

g) a detailed schedule for implementation of the Interim Measure Work Plan and for progress reports. This schedule shall also identify all post-Work Plan Interim Measure documents, and significant related activities, which will be prepared and/or carried out prior to implementation. Such documents may include, e.g., design reports, enhanced design/operation specifications, pre-start-up inspections, and Operation and Maintenance (O&M) plans.

VII.C.2. Final Interim Measure Work Plan

After reviewing the draft Work Plan, the Administrator shall approve the Work Plan as Final, approve the Work plan as Final with modifications, or disapprove the Work Plan with comments. In the latter case, a revised Interim Measure Work Plan shall be submitted to the Administrator by the Permittee for the Administrator's review and approval. The revised Interim Measure Work Plan shall be submitted within fourteen (14) days of receipt of the Administrator's comments and shall satisfactorily address all comments. If the Permittee requests an extension to this response time, the Administrator shall determine if a longer period is needed between the Permittee's receipt of comments and submittal of the revised Work Plan, and notify the Permittee of this determination in writing. Failure to submit a revised Work Plan which adequately addresses each of the

Administrator's comments shall constitute a violation of this permit. In such cases the Administrator will approve the revision as Final with modifications, or disapprove it with comments.

VII.C.3. Following approval of an Interim Measure Work Plan, the Plan shall be incorporated automatically into this permit, and the Permittee shall implement the measure(s) in accordance with the approved Work Plan, beginning on a date established in the Administrator's approval letter. Operation of the measure shall comply with operation and maintenance provisions in the approved Work Plan, or, as instructed by the Administrator, approved plans and reports submitted pursuant to the Work Plan.

VII.C.4. Previous Implementation of Interim Measures: the Permittee has constructed and operated a Soil Vapor and Extraction (SVE) interim measure system to remove volatile hazardous constituents below the surface of the facility property. Until its effectiveness is evaluated in the evaluation due at the time of the draft Comprehensive RFI Report submission (VII.C.5.), or sooner, the Permittee must continue operation of the system unless the system is:

- replaced by a more effective source control/minimization Interim Measure, or
- found to be totally unproductive, or
- actually causing unacceptable levels of gaseous contaminants to be released to the atmosphere, and

the Permittee is unable to corrective the performance problems by replacement of parts, or catalyst or SVE-well maintenance.

The July 2, 1993 Interim Measure Design and Implementation Work Plan for the Georgetown facility is included in Attachment NN. The Permittee shall continue to operate the Soil Vapor Extraction system in compliance with the '93 Work Plan until the Administrator approves the discontinuation of the measure, or the Work Plan is modified per 40 CFR 270 Subpart D.

VII.C.5. Periodic Evaluation of Interim Measure Systems: On an annual basis, the Permittee shall evaluate the performance of all interim measure systems which have been operating for at least one year. This requirement is above and beyond the evaluations of progress required by measure-specific Interim Measure Work Plans (as described in VII.C.1.e.). The evaluation shall include the following:

a) the environmental results attributed to the measure(s) since the last reporting interval;

b) a comparison of the effectiveness of the measure(s) compared to (1) its design goals, (2) its effectiveness at start up, and (3) its effectiveness since the last reporting interval;

c) any problems associated with O&M;

d) if applicable, a discussion of efforts on-going to ensure that the measure(s) does not transfer the contamination to another medium, and if so, that an estimate of risks associated with the transfer; and,

e) any recommendations to improve the overall effectiveness of the measure(s), and/or reduce the long-term O&M costs.

Annual reports of the evaluation shall be prepared by the Permittee and submitted to the Administrator. The first report shall be submitted on the date the Permittee submits the draft Comprehensive RFI Report to the Administrator.

VII.C.6. Interim Measure Progress Reports: within sixty (60) days of the completion of an Interim Measure's start-up phase, the Permittee shall submit to the Administrator an Interim Measure Progress Report. Following this first submittal, the Permittee shall submit Progress Reports for the Interim Measure every six months, or on a more frequent schedule as specified in the approved Interim Measure Work Plan (required by VII.C.1.e.).

Within each Progress Report the Permittee shall submit to the Administrator a demonstration that adequate progress (as defined in the approved Interim Measure Work Plan) is being made towards meeting the interim action objectives/levels. If the Permittee cannot demonstrate that adequate progress is being made, the Permittee must submit a permit modification request, pursuant to requirements in 40 CFR 270.42, proposing measures to achieve adequate progress.

VII.C.7. The Administrator shall review each annual evaluation (VII.C.5.) and progress report (VII.C.6.) and approve it as Final, approve it as Final with modifications, or disapprove it with comments. In the latter case, the Permittee shall submit to the Administrator for review and approval a revised evaluation and/or progress report within thirty (30) days, that satisfactorily addresses the Administrator's comments. Failure to submit a revised evaluation which adequately addresses each of the Administrator's comments shall constitute a violation of this permit. In such cases the Administrator will approve the revision as Final with modifications, or disapprove it with comments.

VII.D. Corrective Measures

The Permittee shall perform a Corrective Measures Study to propose an optimal remedy, or set of remedies, capable of meeting the remedial action objectives and levels contained in the final, approved Comprehensive RFI Report.

VII.D.1. Draft Corrective Measures Study Report

Per the schedule in Table VII-1, the Permittee shall submit to the Administrator a draft Corrective Measures Study (CMS) report. The submittal shall contain remedial action objectives and media cleanup levels from the final Comprehensive RFI Report, corrective measure technologies, screening of those technologies, and corrective measure alternatives capable of achieving the RFI's objectives and cleanup levels.

The Permittee shall identify a preferred corrective measure system which best meets the site-specific remedial action objectives approved by the Administrator in the final Comprehensive RFI Report. This remedy will outperform other remedial alternatives when judged against the selection factors (evaluation criteria) listed below. An estimate of costs to complete all future corrective actions, including design, implementation, monitoring, and closure of the preferred remedy, shall also be submitted, as required by VII.J.

All potential treatment alternatives evaluated as part of this study shall meet the following criteria:

a) protection of human health and the environment through attainment of remedial action levels/objectives identified, and approved, in the Final Comprehensive RFI Report; and,

b) reduction or elimination, to the extent practicable, of further releases that may pose threats to human health or the environment.

The final corrective measure selection factors, required for inclusion and analysis in the Draft Corrective Measures Study Report, include:

- the permanence, and short and long-term practicability and performance reliability of the cleanup technologies
- the reduction of toxicity, mobility, and/or volume through treatment, and the estimated time to achieve these goals
- the short-term risks to public health, workers, and the environment
- the ease or difficulty of implementing the various Corrective Measure alternatives, including technical, administrative, and logistical feasibility

- the capital and annual operation and maintenance costs, net present value of capital and annual operational and maintenance costs, and potential future remedial cost(s)
- any permitting issues, and/or institutional controls associated with the Corrective Measure alternatives
- the amount and nature of wastes generated from the remedial options
- the ability of the Corrective Measure alternatives to achieve the Environmental Indicator concerning protection of current human receptors as quickly as possible, and at least by 2005
- the ability of the Corrective Measure alternatives to achieve the Environmental Indicator concerning cessation of groundwater plume movement as soon as possible, and at least by 2005

Since contaminated groundwater moves in the direction of the Duwamish River, since it is assumed that contaminated groundwater will continue to migrate downgradient in the absence of a Corrective Measure, and due to the expected limitation of the Comprehensive RFI Report to an assessment and description of only current risks and contamination, the CMS Report must additionally include analyses and predictions of future groundwater movement and the risks to receptors potentially exposed to the groundwater (and/or surface water, soil gas, and indoor/outdoor air contaminated by groundwater). These analyses and assessments may be limited to scenarios relating to post-implementation of the Permittee's final Corrective Measure(s) alternatives.

VII.D.2. Final CMS report: the Administrator shall review the draft CMS report and approve it as Final, approve it as Final with modifications, or disapprove it with comments. In the latter case, the Permittee shall revise the report and submit it to the Administrator for review and approval per the schedule in Table VII-1. The revision shall satisfactorily address the Administrator's comments. Failure to submit a revised report which adequately addresses each of the Administrator's comments shall constitute a violation of this permit. In such cases the Administrator will approve the revision as Final with modifications, or disapprove it with comments.

The Administrator's approval of remedial action levels and objectives, and a preferred Corrective Measure, before finalization of the permit modification described in VII.D.3., does not constitute full and final approval. Such full and final approval shall be attained at the time of the Final Permit Modification issuance.

VII.D.3. Permit Modification: once the final CMS report has been approved by the Administrator, the Administrator shall initiate a permit modification pursuant to 40 CFR 270.41, proposing that the Permittee design and implement the measure(s)

preferred in the approved, Final CMS Report. The modification shall also contain a proposed date for submittal of the Draft Corrective Measure Design and Implementation Scope of Work (required by VII.D.4.).

The modification shall establish the overall strategy for managing the proposed remedy's design and implementation. It shall also contain the proposed cleanup criteria (remedial action levels and objectives) and identification of any limiting/bounding factors and conditions associated with the remedial decision.

The Administrator shall solicit public comment on the proposed remedy, new permit language, and the remedial action levels/objectives according to requirements in 40 CFR Part 124. Following the completion of the public comment period, the Administrator shall issue a Final modification, selecting the Corrective Measure. The final modification becomes effective thirty (30) days later, unless appealed.

VII.D.4. Draft Corrective Measure Design and Implementation Scope of Work. Once the permit has been modified to incorporate the selected Corrective Measure(s), and by a date established in the Table VII-1 schedule revision contained in the Permit Modification (see preceding permit condition), the Permittee shall submit to the Administrator a Design and Implementation Scope of Work (SOW) for the selected remedy or remedies. The SOW shall initiate the Corrective Measure process for the selected remedy and establish the overall strategy for managing the remedy's design and implementation. It shall also contain a proposed schedule for preparation and submission all foreseeable design and implementation documents.

Additional elements of the SOW, which must be addressed in the Draft submittal, include:

a) the strategy for Corrective Measure Design and Implementation (and a rationale for the proposed remedial work elements);

b) a *critical-path*, Gantt chart-type schedule and a list of milestones and deliverables. This schedule shall also be provided to the Administrator in electronic format;

c) a list of all needed permits;

d) the identification of any limiting/bounding factors and conditions;

e) the cleanup criteria and measurement methods for meeting the remedial action levels and objectives, as defined in the Final, remedy-selection, Permit Modification (VII.D.3.);

f) general design criteria; and,

g) a Corrective Measure Design and Implementation cost estimate (for third party costs).

VII.D.5. Final Corrective Measure Design and Implementation SOW. The Administrator shall review the draft Corrective Measure Design and Implementation SOW and approve it as final, approve it as Final with modifications, or disapprove it with comments. In the latter case, the Permittee shall revise the Scope of Work to satisfactorily address the Administrator's comments, and submit it to the Administrator for review and approval by a date established in Table VII-1. Failure to submit a revised SOW which adequately addresses each of the Administrator's comments shall constitute a violation of this permit. In such cases the Administrator will approve the revision as Final with modifications, or disapprove it with comments.

VII.D.6. Draft Corrective Measures Design and Implementation Work Plan. The Permittee shall prepare a draft Corrective Measures Design and Implementation (CM) Work Plan for implementing the selected remedy, or remedies. The CM Work Plan shall be submitted to the Administrator in accordance with the schedule contained in Table VII-1 of the permit. The draft CM Work Plan for the design, construction, operation, monitoring, maintenance/repair, and inspection of the remediation system must: a) be consistent with the RCRA Corrective Action Plan (OSWER Directive 9902.3-2A, 5/94); b) be consistent with the Superfund Remedial Design and Action Guidance (9355.0-4A, 6/96), and the Remedial Design/Remedial Action Handbook (9355.0-4B, 6/95), or equivalent Washington State Department of Ecology documents; and, c) at a minimum, meet the following requirements:

a) address applicable local, State, and federal regulatory requirements;

b) include the selected remedy's, or remedies', remedial action levels/objectives (including objectives to achieve the two Environmental Indicators, if those Indicators have not been met), as set forth in the Final remedy-selection, Permit Modification (VII.D.3.), and describe how the design of the corrective measure(s) will achieve these levels/objectives;

c) describe the measurement methods that will be used to confirm achievement of the remedial objectives/levels, and include criteria for assessing monitoring data and triggering any response actions;

d) include a corrective measure groundwater monitoring plan in accordance with permit condition VII.E.;

e) include a corrective measure monitoring plan for any other media for which monitoring is identified by the Permittee or the Administrator within the permit modification described in VII.D.3.;

f) include a revised third party cost estimate for design, construction, and implementation of the selected remedy, and a schedule for adjusting these estimates in accordance with VII.I.2. Also, include an estimate of costs to complete all future corrective actions, as required by VII.J.;

g) include a critical path, Gantt chart-type project schedule, which identifies the significant upcoming Corrective Measure activities, documents, and remedial progress reports deemed critical to the timely implementation and oversight of the Corrective Measure (that must be prepared more frequently than required by VII.D.10.);

h) include a demonstration of financial assurance for full Corrective measure implementation in the form of one of the mechanisms required by section VII.I.;

i) include design/engineering documents, drawings, and specifications;

j) include field oversight protocol, coordination procedures, and the schedule and agenda for all pre-final and final inspections;

k) include a Corrective Measures-specific Health and Safety Plan (which must also discuss emergency procedures related to Corrective Measure implementation). This Plan must be submitted, but it is not the Administrator's intention to review it for approval purposes;

l) include a Corrective Measures-specific waste management plan, and decontamination and decommissioning plan;

m) include a construction Quality Assurance Plan, and a proposal for an independent, third-party specialist (in the technologies constructed) to certify the construction completion and readiness for start up.;

n) include an Operation and Maintenance Plan; and,

o) include proposed Corrective Measure Completion criteria, as well as a proposed definition of "adequate progress" for all stages of the implemented Corrective Measure.

Any proposed post-Work Plan Corrective Measure Implementation documents must be described in the Work Plan, as well as any planned deviations from EPA's

1994 RCRA Corrective Action Plan document (referenced above). In cases where documents are proposed to be submitted following Work Plan approval, the Work Plan must fully describe these documents and explain why the Permittee believes they must be submitted pursuant to Work Plan approval. Proposed due dates for these documents must be contained in the schedule required by condition g) above.

VII.D.7. Final Corrective Measure Design and Implementation Work Plan: The Administrator shall review the draft Corrective Measures Work Plan and approve it as final, approve it with modifications, or disapprove of it with comments. In the latter case, the Permittee shall revise the Work Plan, satisfactorily addressing the Administrator's comments, and submit it to the Administrator for review and approval according to the schedule in Table VII. Failure to submit a revised Work Plan which adequately addresses each of the Administrator's comments shall constitute a violation of this permit. In such cases the Administrator will approve the revision as Final with modifications, or disapprove it with comments.

VII.D.8. Following the Administrator's approval of the Corrective Measures Work Plan, the Permittee shall implement the Work Plan pursuant to the schedule contained therein.

VII.D.9. The Permittee shall engage an independent, third-party specialist in the technologies constructed to certify the construction completion and readiness for start up. Such certification shall be performed according to the final, approved Corrective Measure Work Plan requirements and schedule. Copies of written documentation certifying the completion, and containing the signature of the third-party certifier, shall be provided to the Administrator within thirty (30) days of the date of certification.

VII.D.10. Corrective Measure Progress Reports.

Within 6 months of the start-up of the selected Corrective Measure(s) system, and quarterly thereafter, the Permittee shall submit to the Administrator a demonstration that adequate progress (as defined in the approved Corrective Measure Workplan) is being made towards meeting the remedial action objectives/levels. If the Administrator decides that adequate progress is not being made, the Permittee must submit a permit modification request, pursuant to 40 CFR 270.42, proposing revisions, additions, and/or new measures which will demonstrate adequate progress. In this case the Permittee shall submit the modification request within thirty (30) days of receiving the Administrator's notification, or as otherwise approved in writing by the Administrator, that adequate progress is not being made. The Administrator may also initiate a permit modification, pursuant to 40 CFR 270.41.

VII.D.11. Determination of Corrective Measure Completion: The Permittee may, at any time following the implementation of Corrective Measures, and after four (4) consecutive quarters of monitoring demonstrating that remedial action objectives and levels have been met, submit a written demonstration to the Administrator that these objectives/levels have been achieved, and that no further operation of the measure is necessary to maintain the media cleanup levels at the point of compliance. Such a demonstration shall be contained in a draft Corrective Measure Completion Report, submitted together with a draft Compliance Monitoring Plan (per VII.F.) and a permit modification request per 40 CFR 270.42.

Once the Administrator has acted upon the Permittee's modification request, and in those cases where the request is approved, the Permittee shall:

a) Cease operation of the Corrective Measure system as instructed by the Administrator in the final permit modification;

b) Maintain the Corrective Measure system in readiness for re-starting, if instructed by the Administrator in the final permit modification letter.

c) Implement the approved groundwater Compliance Monitoring Plan, as described in VII.F.; and,

d) For any non-groundwater component of the Corrective Measure system, implement any Compliance Monitoring Plan called for in the Corrective Measures Work Plan, or plans submitted, and approved, subsequent to that document.

If the Administrator denies the permit modification request, the Permittee shall continue operation of the Corrective Measure and Corrective Measure Monitoring (per the approved Plan).

VII.E. Groundwater Corrective Measure Monitoring Plan

VII.E.1. The Groundwater Corrective Measure Monitoring Plan, required in permit condition VII.D.7. as a part of the Corrective Measure Design and Implementation Work Plan, must include plans to design, construct, operate, maintain, inspect, and repair a groundwater monitoring system capable of monitoring the performance of the selected remedy or remedies, and must satisfactorily include, at a minimum, the following additional requirements:

- Designated monitoring locations providing a sufficient number of wells, installed at appropriate locations and depths, to yield samples that represent the quality of groundwater which will be impacted by the groundwater remediation system contained in the approved Corrective Measure;

- Any designated monitoring wells, installed at appropriate locations and depths, to yield samples that represent the quality of groundwater which will be used as an indication of background or upgradient conditions, or for any other purposes than measuring the impact of the remediation system;

- A rationale demonstrating that the proposed monitoring well locations can sufficiently meet the remedial levels/objectives;

- A discussion, and listing of criteria, describing how and when the Permittee shall demonstrate that remediation action levels/objectives have been sufficiently met to discontinue operation of the groundwater component of the Corrective Measure, and begin Compliance Monitoring. The criteria proposed in the Monitoring Plan must be consistent with the criteria set out in the Final Corrective Measure Permit Modification (VII.D.3.);

- The name, monitoring frequency, and analyte/parameter list for all monitoring wells;

- The program operation requirements in accordance with permit condition VII..G.;

- The well construction, maintenance, and replacement requirements in accordance with permit condition VII.H.;

- A project-specific Quality Assurance Plan (QAPjP), consistent with EPA's QAPjP guidance (EPA QA/R-5, 1997). The data evaluation requirements for Corrective Measure groundwater monitoring, and the remedial objectives set out in the Corrective Measure Work Plan (VII.D.8.), must be included in the QAPjP;

- A project schedule for Corrective Measure monitoring activities, including submittal of quality-assured sampling results;

The Groundwater Corrective Measure Monitoring Plan, as part of the Corrective Measure Work Pan, shall be submitted, reviewed, and approved/disapproved by the Administrator together with the Work Pan. Monitoring, in accordance with the approved Plan, shall be implemented once the groundwater component of the Corrective Measure is operating.

VII.E.2. The Groundwater Corrective Measure Monitoring Plan may be modified at any time to better evaluate the performance of the Measure. The Administrator may initiate a modification for the reasons set out in 40 CFR 270.41. Regardless of whether the Administrator or the Permittee initiates the permit modification -- to make changes to the Monitoring Plan -- the modification process will comply with the requirements of 40 CFR 270, Subpart D.

VII.E.3. The Permittee shall enter all monitoring, testing, and analytical data obtained pursuant to this section in the operating record required by VII.A.9.

VII.E.4. All monitoring, testing, and analytical data obtained pursuant to Section VII.E. shall be submitted to the Administrator in digital data files on computer diskette (or other mutually agreeable magnetic media). These data files shall be formatted in accordance with instructions provided by the Administrator.

VII.F. Groundwater Compliance Monitoring: At the completion of the groundwater component of the Corrective Measure a groundwater compliance monitoring plan must be implemented for the purpose of monitoring groundwater at the point(s) of compliance. Compliance monitoring shall help establish how effective the Measure was at achieving remedial action levels/objectives that will continue to be met after discontinuation of the Measure's operation.

VII.F.1. Compliance Monitoring Plan. The Compliance Monitoring Plan must include plans to design, construct, operate, maintain, inspect, and repair a groundwater compliance monitoring system capable of yielding samples representing groundwater quality at the point of compliance, as well as at any monitoring points selected for other purposes. The Permittee shall submit a Draft Compliance Monitoring Plan as part of the Corrective Measures Completion report (VII.D.10). Following review, the Administrator shall either a) approve the Draft Plan as Final, b) approve the Draft Plan as Final, but with modifications, c) disapprove the Draft Plan with comments, or d) in the event the Corrective Measure Completion permit modification request itself is disapproved, disapprove the Plan without comments. If the Plan is disapproved with comments, within thirty (30) days the Permittee shall submit a revised Plan to the Administrator for review and approval which satisfactorily address the Administrator's comments.

At a minimum the Compliance Monitoring Plan must satisfy the following requirements:

a) Sufficient wells to demonstrate that the groundwater at the point(s) of compliance continues to meet the remedial action levels and objectives approved ed in the Final CM Work Plan (VII.D.7.);

b) a discussion, and a listing of the criteria, describing how the Permittee shall propose to demonstrate that remediation action levels/objectives have been met sufficiently, and long enough, to fully close (i.e., take those closure actions beyond discontinuing operation of the system) the groundwater component of the Corrective Measure (per VII.I.), and end Compliance Monitoring;

c) a project-specific Quality Assurance Plan, which includes the data evaluation requirements set out in the Final, approved, Corrective Measure Work Plan (VII.D.8.);

d) a project schedule for Compliance monitoring activities, including submittal of quality-assured sampling results;

e) designated monitoring well locations, monitoring frequencies, and analyte/parameter lists;

f) The program operation requirements in accordance with permit condition VII.G.; and,

g) The well construction, maintenance, and replacement requirements in accordance with permit condition VII.H.

VII.F.2. The groundwater data obtained in accordance with the compliance monitoring plan shall be compared to the Corrective Measure remedial action levels. Any constituent less than the remedial action level will be considered to be in compliance.

VII.F.3. During the compliance monitoring period, detection of constituents in any point-of-compliance monitoring well exceeding the remedial action levels established under this permit, shall cause the Permittee to:

a) Notify the Administrator of this finding in writing within seven (7) calendar days after receiving validated data; and,

b) Immediately collect two (2) samples from any affected well(s) and reanalyze both samples for all constituents with established remedial action levels.

VII.F.4. If analytical results from:

a) Neither validated verification sample described in permit condition VII.F.3.b. confirm the detection of constituents above the remedial action levels, the Permittee shall resume compliance monitoring according to the established schedule and notify the Administrator that the compliance monitoring program is being resumed;

b) Both or one of the validated verification samples described in permit condition VII.F.3.b. confirm the detection of constituents above the remedial action levels, the Permittee shall continue to monitor in accordance with the approved compliance monitoring program in effect, but will:

i) Re-implement the groundwater component of the Corrective Measures system within 90 days, unless otherwise instructed by the Administrator; or,

ii) Submit to the Administrator, within seven (7) calendar days of receiving validated data, notice that the Permittee intends to demonstrate that an off-site source caused the increase. If the Administrator approves this course of action, a report of the off-site demonstration shall be made within sixty (60) calendar days. If necessary, a request for a modification to the Compliance Monitoring Plan (a permit modification per 40 CFR 270.42)

shall be submitted with the demonstration report. If the Administrator disapproves the demonstration, the Permittee shall re-implement the groundwater component of the Corrective Measures system within thirty (30) days of receipt of the Administrator's disapproval.

If the Corrective Measures system, or a portion of the system, is re-implemented, the Permittee shall simultaneously re-implement the Corrective Measure Monitoring Plan (required by section VII.E.). To return to Compliance monitoring, the Permittee must follow procedures in VII.D.11. to determine, and receive the Administrator's approval, that Corrective Measures may be considered completed.

VII.F.5. The Permittee may, at any time following the implementation of Compliance Monitoring, and after twelve (12) consecutive quarters of monitoring demonstrating that remedial action objectives and levels continue to be met, submit a written demonstration to the Administrator showing that these objectives/levels have been achieved and that the criteria for closure in the Compliance Monitoring plan have been met. The Permittee may then propose that portions or the entirety of the groundwater Corrective Measure and/or Compliance Monitoring Program be closed/terminated. Such a proposal shall be contained in a permit modification request per 40 CFR 270.42, and shall include a demonstration that the discontinued Corrective Measure need no longer be kept in readiness for operation. The Administrator shall review the permit modification request. If the Administrator agrees that the remedial action levels/objectives of the Corrective Measure have been met, that these levels will be maintained without active remediation efforts, and that the continued stand-by status of the system is no longer necessary, the Permittee can close the system per VII.I. (if applicable). Closure of the Corrective Measure system does not shield the Permittee from the need to restart a measure if the Administrator determines that conditions require such action.

If the Administrator approves a permit modification to discontinue groundwater Compliance Monitoring, these activities may be terminated.

VII.F.6. The Permittee shall enter all monitoring, testing, and analytical data obtained during Compliance Monitoring in the operating record required by VII.A.9.

VII.F.7. All monitoring, testing, and analytical data obtained pursuant to Section VII.F. shall be submitted to the Administrator in digital data files on computer diskette (or other mutually agreeable magnetic media). These data files shall be formatted in accordance with instructions provided by the Administrator.

VII.G. Program Operation for Groundwater Monitoring

VII.G.1. The Permittee shall use: the techniques and procedures for groundwater analysis specified in the most recent edition of EPA SW-846, Test Methods for Evaluating Solid Waste, or other acceptable analytical methods approved by the Administrator; well sampling procedures conducted in accordance with the most recent RCRA Groundwater Monitoring Guidance; and, the specific requirements of sampling plans approved under Part VII of this permit.

VII.G.2. The Permittee shall obtain water level elevation measurements from each monitoring well, at a frequency specified in the applicable plan. Measurements for each monitoring well shall be obtained prior to purging of the well. In order to minimize the potential for error caused by temporal variations, the Permittee shall obtain all water level elevation measurements within as short a time period as possible, not to exceed one working day.

The Permittee shall use these data to determine the rate and direction of groundwater flow at least annually for the periods of high and low water table elevation. The resultant contour maps and flow rates shall be submitted to the Administrator by March 1 of each year. The Permittee shall submit, with the contour maps, a data analysis report which includes an evaluation of the adequacy of the groundwater monitoring system to detect contaminant movement relative to observed groundwater flow directions.

VII.G.3. Quality assured results of analyses, including laboratory detection limits achieved for each constituent, shall be submitted to the Administrator: a) according to the schedule of the appropriate groundwater monitoring program per Sections VII.B., VII.E., and VII.F. of this permit, and in any case, b) no later than ninety (90) days following sampling.

VII.G.4. The Permittee shall biennially analyze a groundwater sample from one monitoring well for all 40 CFR 264 Appendix IX constituents. The well shall be proposed in writing by the Permittee at least thirty (30) days in advance of the sampling, and shall be selected by the Administrator. Selection and approval of the monitoring well identified for 40 CFR 264 Appendix IX monitoring shall not require a permit modification. Selection and approval of the monitoring well shall be based on location, and the number and levels of contaminants detected at the proposed well location, so as to best meet the monitoring objectives stated in the respective, approved monitoring plans.

If any 40 CFR Appendix IX constituents not included in the monitoring programs approved under VII.B., VII.E. or VII.F. are detected, the Permittee shall complete the procedures in VII.G.5. within thirty (30) calendar days of the Permittee's

receipt of validated results. In no case shall the period between the date of sampling and the date of submission of analytical results to the Administrator exceed ninety (90) calendar days. An exception to this requirement is the case where groundwater metals concentrations are detected at levels exceeding PQLs, but at levels that the Administrator has determined to be in the range of background concentrations. In this case, the Permittee shall only proceed to VII.G.5. if the metal analyte level is a contaminant of potential concern, and its concentration is above approved screening levels (for Pre-Corrective Measure Monitoring) or remedial levels (established in the permit modification documenting the chosen Corrective Measure).

VII.G.5. For any Appendix IX constituent(s) detected above their Practical Quantitation Limit under permit condition VII.G.4. that is not included in the monitoring program currently in effect under the permit, the Permittee shall:

a) Add the newly detected constituent(s) to the list of monitoring constituents, and provide the Administrator with a copy of the revised list for inclusion into the Plan(s) approved per conditions VII.B., E., or F. In addition, include information related to sampling and analytical methodology for the new analyte, method detection limits, QA, and other information consistent with the respective Monitoring Plan. The Administrator shall inform the Permittee if, according to 40 CFR 270.42, such modification will require a permit modification; or,

b) Submit a report justifying why the detected constituent(s) should not be included in the monitoring program. If the Administrator does not accept the Permittee's justification, the Permittee shall, upon receipt of the Administrator's determination, add the constituent to the monitoring list in accordance with VII.G.5.a. If the Administrator accepts the justification, the constituent does not have to be added to the list of monitoring constituents; or,

c) Submit a notice to the Administrator that the Permittee has resampled and is repeating the analysis for the newly detected constituent(s). Within thirty (30) calendar days of the Permittee's receipt of results of the second analysis, the Permittee shall submit the results of the second analysis to the Administrator. In no case shall the period between the date of sampling and the date of submission of analytical results to the Administrator exceed ninety (90) calendar days. The Permittee shall either add the newly detected constituent(s) to the list of monitoring constituents pursuant to VII.G.5.a., or submit a report justifying why the detected constituent(s) should not be included in the monitoring program pursuant to VII.G.5.b.

VII.H. Well Construction, Maintenance and Replacement

VII.H.1. The Permittee shall maintain all monitoring wells in good working order, making necessary repairs in a timely manner so that the sampling program is not hindered or delayed in any way. The Permittee shall maintain an adequate supply of replacement parts and repair equipment as necessary to ensure that each sampling event proceeds on schedule.

VII.H.2. Visual evidence of damage to or deterioration of wells, and complete records of all well maintenance activities, must be noted in the operating record.

VII.H.3. The Permittee shall maintain borehole integrity of each monitoring well, using one of the methods designated in permit conditions VII.H.3.a., VII.H.b., or VII.H.c., consistently using the same method for each well.

a) For any existing monitoring well, the Permittee shall calculate the specific capacity of that well during the first sampling event after the effective date of this permit. The specific capacity shall then be recalculated for that well on a biennial basis during the term of this permit. If, at any time, the specific capacity of that well decreases by more than twenty percent (20%) of the original calculated value, that well shall be redeveloped to within five percent of the original specific capacity.

The Permittee shall calculate the specific capacity for any well installed during the term of this permit during the first sampling event for which that well is available for sampling. The recalculation and redevelopment criteria, as specified above for existing wells, shall then be followed by the Permittee; or,

b) The well shall be sounded on an annual basis. If the well has a build-up of one (1.0) foot or more of sediment at the bottom, the well shall be redeveloped and the sediment removed; or,

c) For any existing monitoring well, the Permittee shall perform a slug test on the well to determine the hydraulic conductivity of the well during the first sampling event after the effective date of this permit. A slug test shall then be performed on the well on a biennial basis using the same slug test method. If the hydraulic conductivity determined by this method decreases by twenty percent (20%) or greater from the original value, that well shall be redeveloped to within five percent (5%) of the original hydraulic conductivity.

The Permittee shall perform a slug test noted above to determine the hydraulic conductivity of any well installed during the term of this permit during the first sampling event for which that well is available for sampling. The re-performance

of the slug test and the redevelopment criteria shall be conducted by the Permittee as specified above for existing wells.

VII.H.4. If a monitoring well must be decommissioned, the Permittee shall give notice in writing to the Administrator of the rationale for the decision at least thirty (30) days prior to the actual decommissioning. The notice shall include a proposed timeframe and location for well replacement. The Administrator shall review the proposal and approve it, disapprove it with comments, or approve it with modifications. If the Administrator disapproves the proposal, the Permittee shall replace the well per the Administrator's instructions in the disapproval letter. The Permittee shall also provide information regarding the new well in the operating record and to the Administrator as specified by permit conditions VII.H.5. and VII.H.6.

The Permittee shall close each well being replaced no later than ninety (90) calendar days after installation of the replacement well. Wells must be abandoned per Washington State requirements in WAC 170-303-160. Unless samples from that well have been at or below the approved clean-up levels for three (3) consecutive years, closure of wells that are not separated from the contaminated zones by a well-defined aquitard (defined below) shall be accomplished by pulling the casing or drilling out the casing and screen, redrilling the borehole, and backfilling the entire depth of the borehole with a three to five percent (3% - 5%) bentonite and cement grout, using a tremie pipe. With prior EPA approval, wells that are separated from the contaminated zones by a continuous, well-defined aquitard can be abandoned by having their casings ripped below the seal, to destroy the screen and filter pack, and pressure grouting from the bottom up. Equivalent or superior methods may be substituted upon written approval of such substitution by the Administrator. Such substitution and approval will not require a permit modification. The Permittee shall provide information regarding closed wells in the operating record and to the Administrator as specified by permit conditions VII.H.5. and VII.H.6.

VII.H.5. Minor deviations from the abandonment procedures specified in VII.H.4. deemed necessary by the Permittee due to unforeseen events in the field at the time of well abandonment shall not be considered a modification of this permit. The Permittee shall place a notation of such a deviation, accompanied by a narrative explanation, in the operating record. The Administrator may judge the soundness of this determination during inspections of the facility and take appropriate action.

VII.H.6. Inspection of drilling and well construction of any new or replacement monitoring well shall be performed by a qualified geologist. The geologist shall construct and maintain a detailed log of each well describing the geologic strata encountered during drilling. The logs and descriptions shall include:

(a) Date and time of construction;
(b) Drilling method and any fluid used;
(c) Well location (surveyed to within 0.5 feet);
(d) Borehole diameter and well casing diameter;
(e) Well depth (to within 0.1 feet);
(f) Drilling logs and lithologic logs from the field, including a description of soil or rock types, color, weathering, texture, structure and fractures;
(g) Casing materials;
(h) Screen material and design, including screen length and slot size;
(i) Casing and screen joint type;
(j) Filter pack material, including size and placement method and approximate volume;
(k) Composition and approximate volume for sealant material and method of placement;
(l) Surface seal design and construction;
(m) Well development procedures;
(n) Ground surface elevation (to within 0.01 feet);
(o) Top of casing elevation (to within 0.01 feet); and,
(p) Detailed drawing of well, including dimensions.

VII.H.7. The Permittee shall submit the logs and descriptions obtained pursuant to permit condition VII.H.6., as-built drawings, and location information of the new well to the Administrator within sixty (60) calendar days after completion of the well or by the schedule approved by the Administrator in specific work plans.

VII.I. Corrective Measures System Closure

The Permittee shall submit to the Administrator a request to close the Corrective Measure system at least ninety (90) calendar days before closure is anticipated. At this time, the Permittee shall submit a Corrective Measure closure plan. The plan shall be submitted as a permit modification request in accordance with 40 CFR 270.42, unless the Administrator judges, based on the plan's proposals, that a Class 2 modification is unwarranted. In this event the Permittee shall submit a Class 1 modification request with prior Administrator approval. The closure plan must include detailed procedures and a schedule for the disposal or decontamination of all elements of the Corrective Measure.

For the purposes of this section (VII.I.), "closure" is used in its broad context as any activities related to the Corrective Measure the Permittee takes following discontinuation of the Measure's operation. Closure of the Corrective Measure, as described in VII.F.5., therefore, does not imply that the Corrective Measure is necessarily a hazardous waste treatment, storage, or disposal unit/facility.

VII.I.1. Corrective Measures Closure Cost Estimate. Within sixty (60) calendar days of the Administrator's approval of the Final Corrective Measures Work Plan, the Permittee shall prepare a detailed estimate of the total costs for closing the Corrective Measures system. Furthermore, upon completion of any post-Workplan design documents, and/or the physical construction of the Corrective Measures system, the Permittee must modify (as needed), in writing, the closure estimates submitted previously, and re-submit them to the Administrator within thirty (30) days of such document or task completion. In addition, pursuant to making any needed and approved changes to the Corrective Measure, or its closure plan, the Permittee shall prepare and submit to the Administrator a revised cost estimate for the closure of the Corrective Measures system within thirty (30) calendar days of implementing an approved modification of the Corrective Measures system. The Permittee shall include the estimate(s) in the VII.A.9. operating record. If, however, the Administrator disapproves the estimate(s) with comments, the Permittee must address these comments in a final estimate submitted thirty (30) days after receipt of the Administrator's comments.

VII.I.2. The Permittee shall annually adjust the cost estimates for inflation within thirty (30) calendar days after each publication of the new year's inflation factor. The adjustment shall be contained in the VII.A.9. operating record and submitted to the Administrator.

VII.I.3. The Permittee shall keep a copy of the latest Corrective Measure cost estimates, including closure cost estimates, in the VII.A.9. operating record.

VII.J. Corrective Action Financial Assurance

The Permittee shall establish and maintain financial assurance in a form consistent with 40 CFR 264.143, to be approved by the Administrator, and in the amount of the most recent, approved Corrective Action completion cost estimates required below. The Permittee shall provide the Administrator documentation of this financial assurance within 60 calendar days of the Administrator's approval of the respective Plan or Report identified below.

VII.J.1. Draft Comprehensive RFI Report. This Report shall contain an attachment, estimating the full costs of: completing the RFI; conducting the CMS; designing, implementing, and monitoring any known, required Interim Measures; designing a likely Corrective Measure; implementing the Measure; monitoring the Measure; and closing the Measure. The estimate shall be subject to review and approval by the Administrator, along with the RFI Report.

VII.J.2. Draft Corrective Measures Study Report. This Report shall contain an attachment, estimating the full costs of: completing the CMS; designing, implementing, and monitoring any known, required Interim Measures; designing a likely Corrective Measure; implementing the Measure; monitoring the Measure; and closing the Measure. The estimate shall be subject to review and approval by the Administrator, along with the CMS Report.

VII.J.3. Draft Corrective Measures Design and Implementation Work Plan. This Work Plan shall contain an attachment, estimating the full costs of: monitoring any known, required Interim Measures; designing the selected Corrective Measure; implementing the Measure; monitoring the Measure; and closing the Measure. The estimate shall be subject to review and approval by the Administrator, along with the Work Plan..

VII.K Dispute Resolution

VII.K.1. In the event the Administrator approves with modification, or disapproves, in whole or in part, any plan, report, or schedule required by Part VII of this permit, the following procedure will apply:

a) The Administrator will notify the Permittee in writing of the disapproval or proposed modification to the plan, schedule, or submittal. Such notice shall:

i) Identify the problem(s) and, where appropriate, suggest the exact change(s) which need to be made to the plan, schedule, or submittal;

ii) Provide an explanation and supporting documentation or data of why modification is needed; and,

iii) Provide a date by which comments on the proposed modification or disapproval must be received from the Permittee. Such date will not be less than thirty (30) calendar days from the date of the Permittee's receipt of the notice under permit condition VII.K.1.a.

b) If the Administrator receives no written comments on the disapproval or proposed modification from the Permittee, the disapproval or modification will become effective five (5) calendar days after the close of the response period specified under condition VII.K.1.a.iii. The Administrator will promptly notify the Permittee that the modification has become effective.

VII.K.2. If the Permittee chooses to invoke the provisions of this section, the Permittee shall notify the Administrator in writing within thirty (30) days of receipt of the notice under permit condition VII.K.1.a). Such notice shall set forth the specific matter in dispute, the position the Permittee asserts should be adopted as consistent with the requirements of this permit, the basis for the Permittee's position, and any matters considered necessary for the Administrator's determination.

a) The Administrator and the Permittee shall have an additional thirty (30) days from EPA's receipt of the notification, provided for in VII.K.2., to meet or confer to resolve any disagreement.

b) If agreement is reached, the Permittee shall comply with the terms of such agreement or if appropriate submit the revised submittal and implement the same in accordance with, and within the timeframe specified in, such agreement.

c) If agreement is not reached with the thirty (30) day period, the Administrator

shall make a final determination concerning the disapproval or modification and notify the Permittee in writing of the final decision. The Permittee shall comply with the terms and conditions of the administrator's decision in the dispute. Such notification shall:

i) Indicate the effective date of the disapproval or modification, which shall be no later than fifteen (15) calendar days after the date of notification of the final decision;

ii) Include an explanation of how comments were considered in developing the final disapproval or modification; and,

iii) Provide a copy of the final disapproval or modification.

VII.K.3. The Administrator's decision using the procedures specified in permit conditions VII.K.1. and K.2. does not require permit modification and is not subject to administrative appeal.

VII.L. Off-site Access

To the extent that work required by this permit must be done on property not owned or controlled by the Permittee, the Permittee shall use its best efforts to obtain site access agreements from the present owner(s) of such property. "Best efforts" shall mean, at a minimum, a certified letter from the Permittee to the relevant property owner(s) stating the need and purpose for site access, requesting access to such property by the Permittee, the Administrator, and the Administrator's authorized representatives, and offering reasonable compensation for any financial losses sustained as a result of the activities conducted during the access period. If a reply is received from the property owner(s), the Permittee shall send follow-up letters as appropriate to clarify the work contemplated and address the owner's reasonable concerns. The Administrator may assist the Permittee in obtaining such agreements.

VII.M. Other Permits and/or Approvals

To the extent that work required by this permit must be done under a permit(s) and/or approval(s) pursuant to other Federal, State, or local regulatory authorities, the Permittee shall use its best efforts to obtain such permits in a timely manner. For the purposes of this permit condition, "best efforts" shall mean submittal of a complete application for the permit(s) and/or approval(s) at the earliest opportunity after the information necessary to prepare the application is available to the Permittee.

VII.N. Inability to meet the Corrective Action Schedule

Failure to meet the schedules contained in this permit shall constitute a violation of the permit. The Permittee shall notify the Administrator in writing as soon as possible of any deviations or expected deviations from the schedules contained in this permit. The Permittee shall include with the notification information to support that the Permittee has used its best efforts to meet the required schedules.

Depending on the length of the deviation, and the impact on future activities, deliverables, and their due dates, Table VII-1, and/or other portions of this permit, may require modification. In this event, as determined by the Administrator, the Permittee shall submit a permit modification request per 40 CFR 270.42. The Administrator may also initiate a permit modification to modify Table VII-1, or other parts of the permit relating to the schedule for corrective action activities and document submittals, as specified in 40 CFR 270.41.

TABLE VII-1: CORRECTIVE ACTION COMPLIANCE SCHEDULE

Item #	Permit Condition	Due Date
2	VII.A.3.d. - Draft Risk Assessment Work Plan	15 days after the effective date of this Permit Modification (currently in draft form, and out for public comment)
3	VII.A.3.d.- Final Risk Assessment Work Plan	30 days after receipt of the Administrator's comments on the Draft
4	VII.A.4.a - Draft Comprehensive RFI Report	June 1, 2001
5	VII.A.4.b - Final Comprehensive RFI Report	45 days after receipt of the Administrator's comments on the Draft
6	VII.A.7 - RFI Progress Reports	Every six months on February 10 and August 10
11	VII.D.1 - Draft Corrective Measure Study Report	Within 60 days of the Administrator's approval of the Final Comprehensive RFI Report
12	VII.D.2 - Final Corrective Measure Study Report	Within 45 days of receipt of the Administrator's comments on the Draft.
13	VII.D.3 - Permit Modification (including public comment on the draft permit modification)	Following the Administrator's approval of the Final Corrective Measure Study *See Below

14	VII.D.4 - Draft Corrective Measure Design and Implementation Scope of Work	Per the date established in the Final Permit Modification (see Item #13)
15	VII.D.5 - Final Corrective Measure Design and Implementation Scope of Work	Within 30 days of receipt of the Administrator's comments on the Draft
16	VII.D.6 - Draft Corrective Measure Work Plan	Within 45 days of the Administrator's approval of the Final Corrective Measure Design and Implementation Scope of Work, or no later than 180 days following the effective date of the permit modification (Item #13), whichever is soonest
17	VII.D.7 - Final Corrective Measure Work Plan	Within 45 days of receipt of the Administrator's comments on the Draft
18	VII.D.8. - Closure of the Corrective Measure System	Provide 90 days notice of closure to EPA

* Assuming the modification here is an Agency-initiated modification (per 40 CFR 270 Subpart D), the Administrator will prepare a draft permit modification per procedures in 40 CFR 124. This draft permit modification will be available for public comment, along with the Administrator's Statement of Basis. At the end of this comment period the Administrator will consider all comments and prepare a final permit modification.

TABLE VII-2: PRE-CORRECTIVE ACTION MONITORING

TABLE VII-4: GROUNDWATER CLEANUP STANDARDS

APPENDIX MM: INTERIM MEASURE JUSTIFICATION QUESTIONS

ATTACHMENT NN -- SCOPES OF WORK, PLANS, AND WORKPLANS

CONTENTS:

○ Final RFI Addendum Scope of Work (October 1999). Hereby incorporated by reference.

○ Documents addressing additional RFI Tasks:

In June 2000 the Permittee proposed a new direction for certain elements of the RFI. As part of this proposal the Permittee agreed to: (1) submit an off-site characterization work plan -- for performing groundwater characterization activities; (2) submit a work plan for performing additional soil gas measurements and installing monitoring wells in the contaminated downgradient areas southwest of Denver Avenue; and, (3) conduct analyses of future contaminant scenarios (with reasonably protective fate and transport assumptions and direct the Permittee to plan, design, and implement an interim measure considerations) as part of the Corrective Measures Study, rather than the RFI. The final off-site characterization work plan was approved by the Administrator on September 29, 2000.

The final work plan for the second phase of the soil gas measurement effort was approved by the Administrator on December 4, 2000. Both of these work plans are hereby incorporated into the permit by reference.

○ Pre-Corrective Action Monitoring Plan. A "Final Pre-Corrective Action Monitoring Plan" was submitted by the Permittee in July of 1992. The Plan was approved by the Administrator in August of 1992, and is hereby incorporated by reference.

DRAFT PERMIT TABLE VII-2
PRE-CORRECTIVE ACTION MONITORING PROGRAM
PHILIP GEORGETOWN FACILITY

Well	Analyses						
	VOC	Phenols(a)	SVOC	PCBs	Metals(b)	Cyanide	Appendix IX(c)
CG-1-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-1-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-1-D	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-2-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-2-D	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-2-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-3	1,2,3,4 (d)	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-4-D	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-5-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-5-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-5-D	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-6-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-7-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-8-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-9-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-9-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-10-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-11-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-12-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-101-S1	1,2,3,4(d)	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-102-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA

Well	Analyses						
	VOC	Phenols(a)	SVOC	PCBs	Metals(b)	Cyanide	Appendix IX(c)
CG-102-S2	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-102-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-102-D	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-103-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-103-S2	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-103-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-104-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-104-S2	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-104-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	1, every two years
CG-104-D	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-105-S1	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-105-S2	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-105-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA
CG-111-I	1,2,3,4	1,3	2,4	2,4	2,4	1,2,3,4	NA

1 Winter Sampling Event (February)

2 Spring Sampling Event (May)

3 Summer Sampling Event (August)

4 Fall Sampling Event (November)

a Phenols include 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol, and phenol.

b Currently groundwater sampling for metals includes: barium, cadmium, chromium, copper, nickel, silver, zinc, arsenic, lead, and selenium according to the October 19, 1999 information request response prepared by Philip.

c Appendix IX groundwater monitoring shall include the full list of Appendix IX constituents specified in 40 Code of Federal Regulations 264 including VOC, SVOC, pesticides and herbicides, PCBs, metals, cyanide, and sulfide.

d	Based on the revised Permit Table VII-2 dated June 15, 1995, these wells are required to be monitored on semiannual basis. The required quarter for semiannual monitoring of these two wells are not specified in the revised Permit table. Philip proposes sampling these wells on a quarterly basis for VOCs and Tetra Tech concurs with this proposal.
NA	Not Analyzed
PCBs	Polychlorinated Biphenyls
SVOC	Semivolatile organic compounds
VOC	Volatile organic compounds